Stoller
Grand Junction Office established 1959

299-W22-04 (A7830)
Log Data Report

Borehole Information:

Borehole:	299-W22-04 (A7830)		Site:	216-S-1 & 2 Crib	
Coordinates (WA St Plane)		GWL[1] (ft) :	231.3	GWL Date:	08/27/03
North	East	Drill Date	TOC[2] Elevation (ft)	Total Depth (ft)	Type
134254.217 m	567082.801 m	08/55	677.39	316	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	1.70	8 5/8	8	5/16	+1.70	314

Borehole Notes:

The logging engineer measured the casing stickup using a steel tape. A caliper was used to measure the outside casing diameter. The caliper and inside casing diameter were measured using a steel tape, rounded to the nearest 1/16 in.; casing thickness was calculated. Total depth (316 ft) is derived from Ledgerwood (1993). However, total logging depth was 230 ft, 1.3 ft above groundwater. Because of waste management issues, Stoller was not permitted to log below the water table. Ledgerwood (1993) reported the casing was perforated from 200 to 314 ft. The logging engineer measured the depth to water. Coordinates and top of casing (TOC) elevation are derived from HWIS[3]. Logging data acquisition is referenced to the TOC.

Logging Equipment Information:

Logging System:	Gamma 1E		Type:	SGLS (70%) SN: 34TP40587A
Calibration Date:	07/03	Calibration Reference:	GJO-2003-468-TAR	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	3		
Date	08/27/03	08/28/03	08/28/03		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	230.0	89.0	64.0		
Finish Depth (ft)	65.0	65.0	2.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	1.0		
ft/min	N/A[4]	N/A	N/A		
Pre-Verification	AE028CAB	AE029CAB	AE029CAB		
Start File	AE028000	AE029000	AE029025		
Finish File	AE028165	AE029024	AE029087		

Log Run	1	2 Repeat	3		
Post-Verification	AE028CAA	AE029CAA	AE029CAA		
Depth Return Error (in.)	-1	N/A	-1		
Comments	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.		

Logging Operation Notes:

Spectral gamma logging was performed in this borehole on August 27 and August 28, 2003. Logging was conducted with a centralizer on the sonde and measurements are referenced to TOC. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	09/11/03	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A casing correction for 0.3125-in.-thick casing was applied throughout the borehole.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G1EJul03.xls using an efficiency function determined from annual calibrations. Dead time and water corrections were not necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (^{137}Cs) detected in the borehole, naturally occurring radionuclides (^{40}K, ^{238}U, ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. A repeat log section is also included.

Results and Interpretations:

^{137}Cs was the man-made radionuclide detected in this borehole. ^{137}Cs was detected at a few sporadic locations in the borehole near its MDL of approximately 0.2 pCi/g.

Notable changes are observed in the KUT and total gamma logs that are consistent with the driller's log. An interval between 43 and 60 ft indicates relatively low ^{40}K concentrations. The driller's log suggests "pure gravel" in this interval. Between 60 and 139 ft the driller's log suggests predominantly a sandy silt. This interval is delineated by the ^{40}K concentrations that increased by about 5 pCi/g.

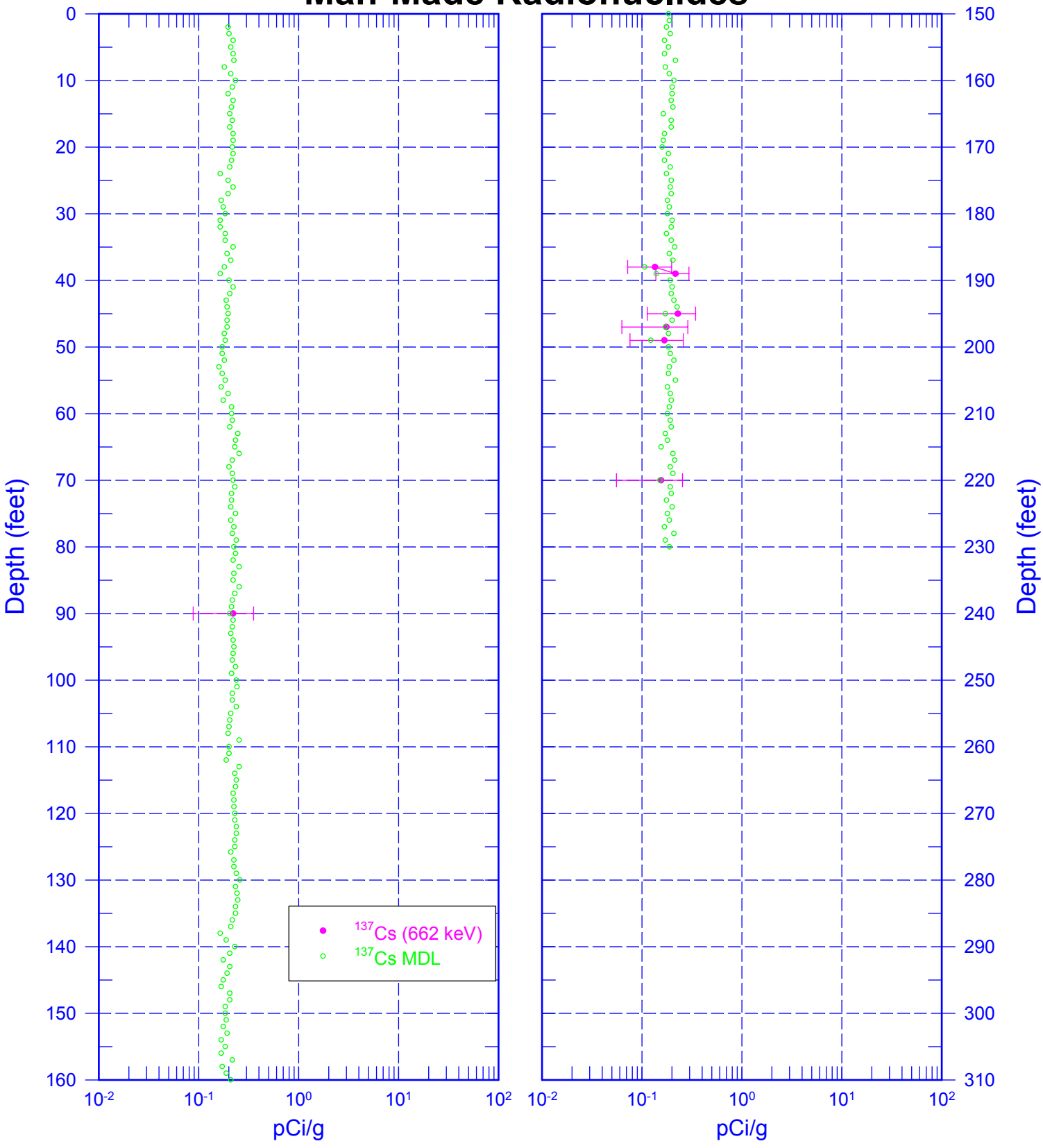
The repeat section indicated good agreement of the naturally occurring KUT.

References:

Ledgerwood, R.K., 1993. *Summaries of Well Construction Data and Field Observations for Existing 200-East Resource Protection Wells*, WHC-SD-ER-TI-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

[1] GWL – groundwater level
[2] TOC – top of casing
[3] HWIS – Hanford Well Information System
[4] N/A – not applicable

299-W22-04 (A7830)
Man-Made Radionuclides

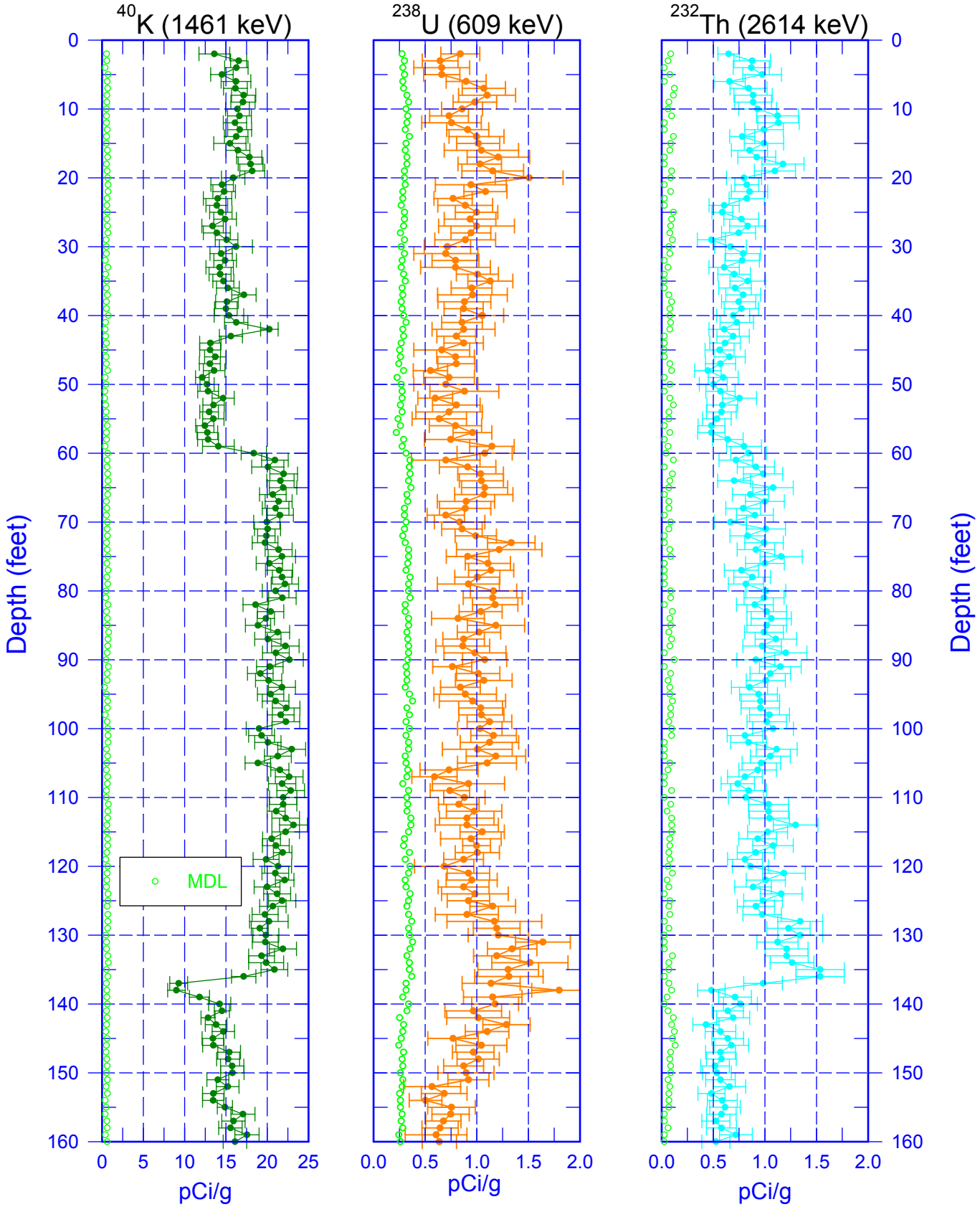


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Log Date - 08/28/03

299-W22-04 (A7830)
Natural Gamma Logs

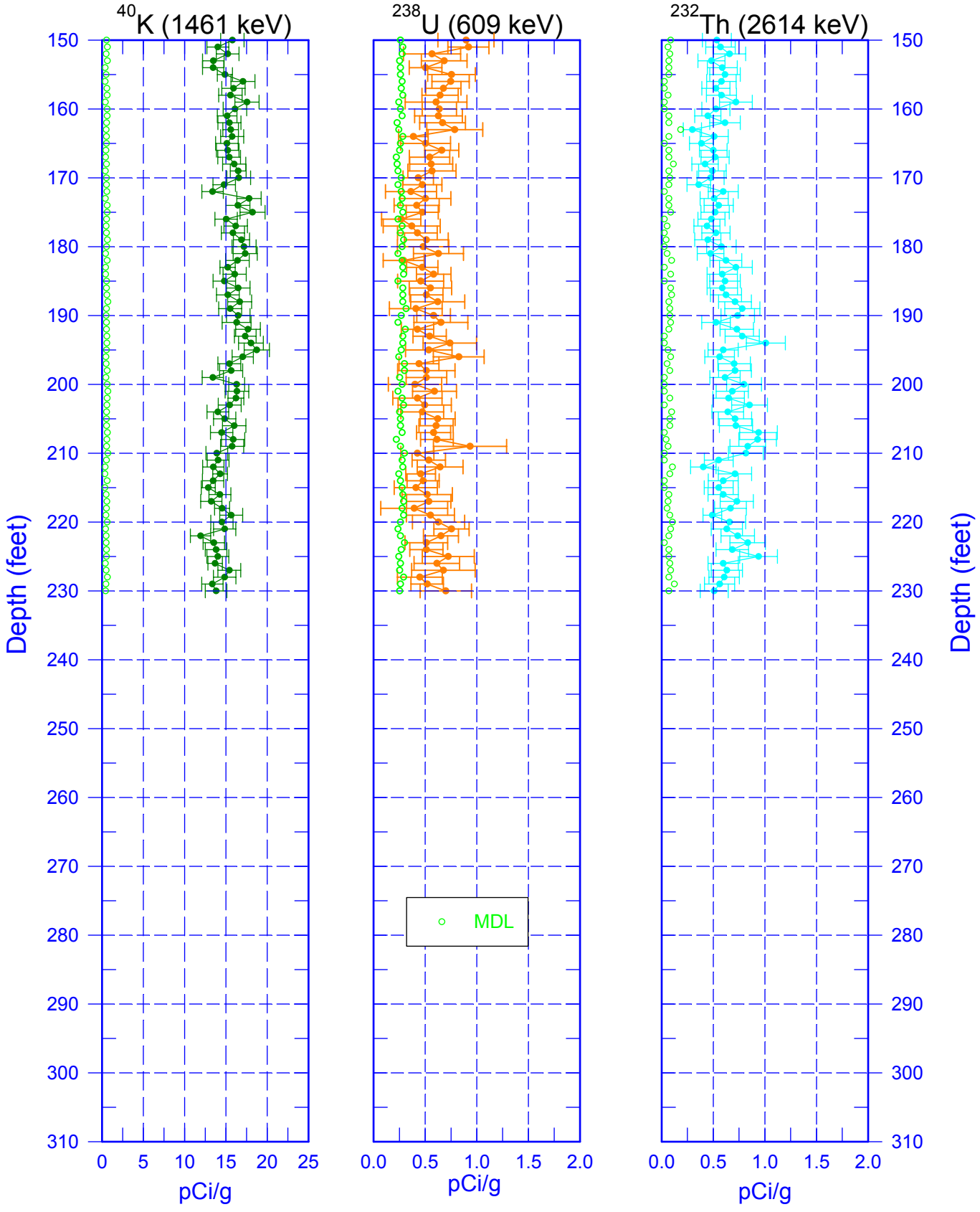


Zero Reference = Top of Casing

Depth scale: 1" = 20 ft

Last Log Date - 08/28/03

299-W22-04 (A7830)
Natural Gamma Logs

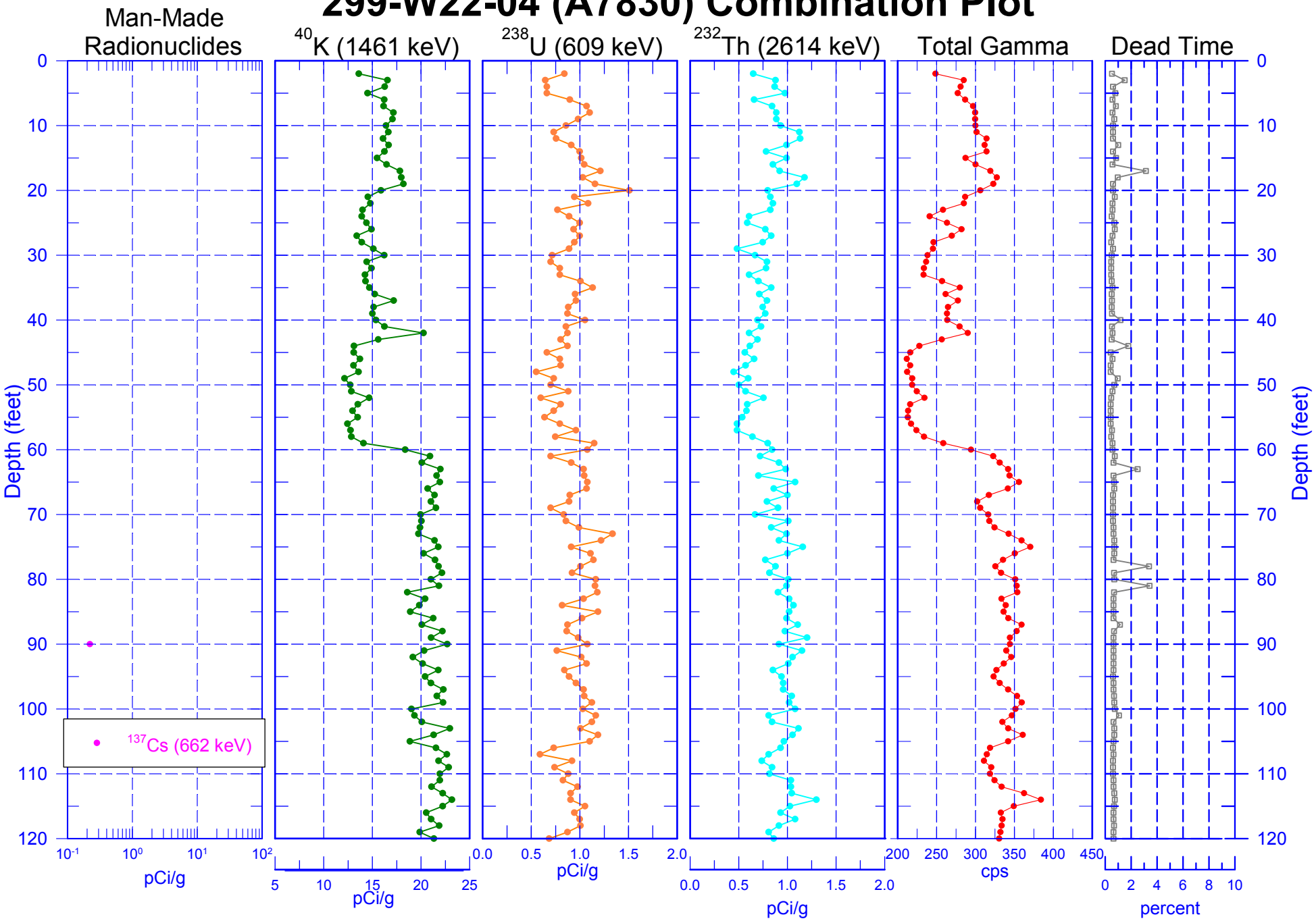


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Log Date - 08/28/03

299-W22-04 (A7830) Combination Plot

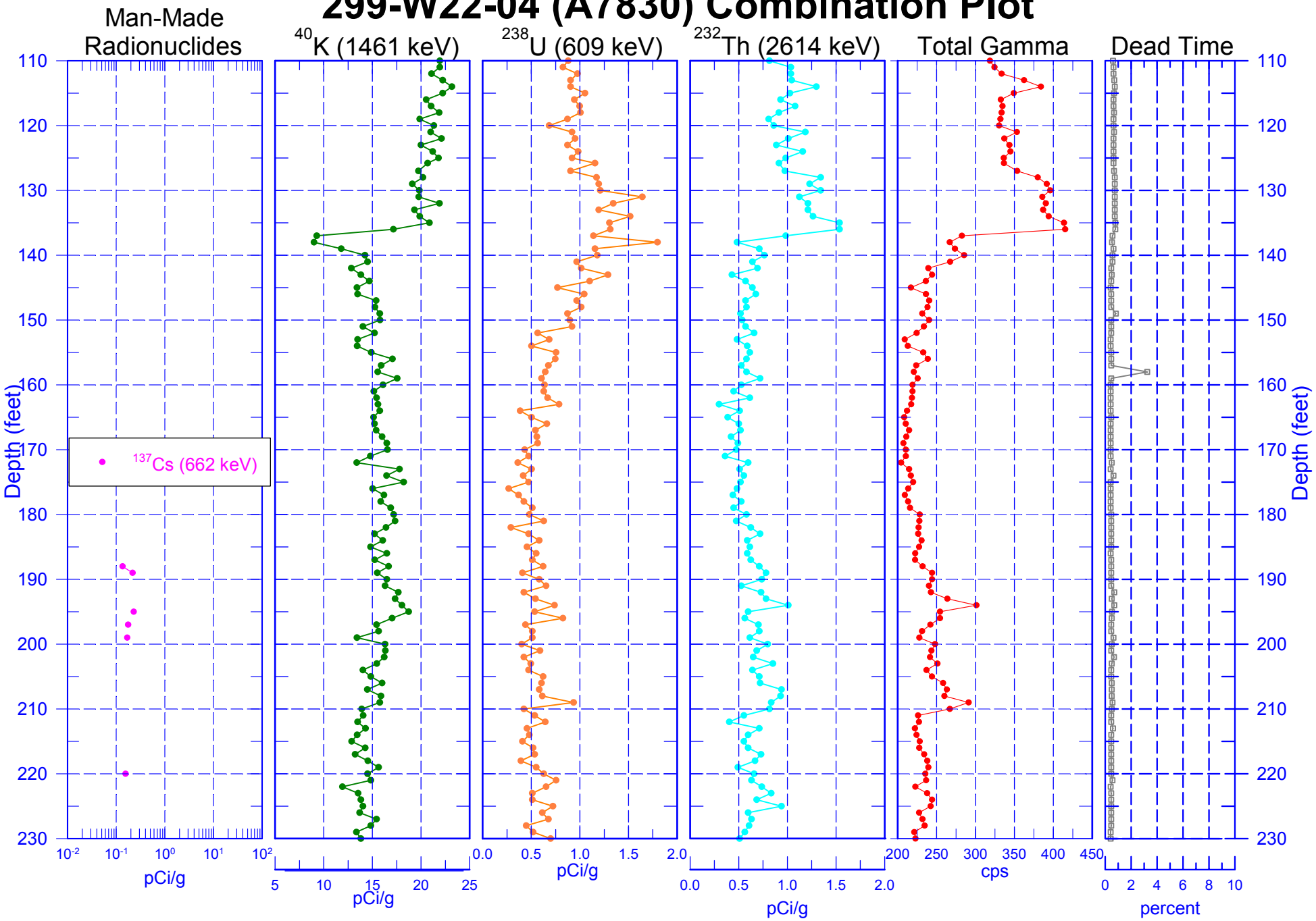


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Logging Date - 08/28/03

299-W22-04 (A7830) Combination Plot

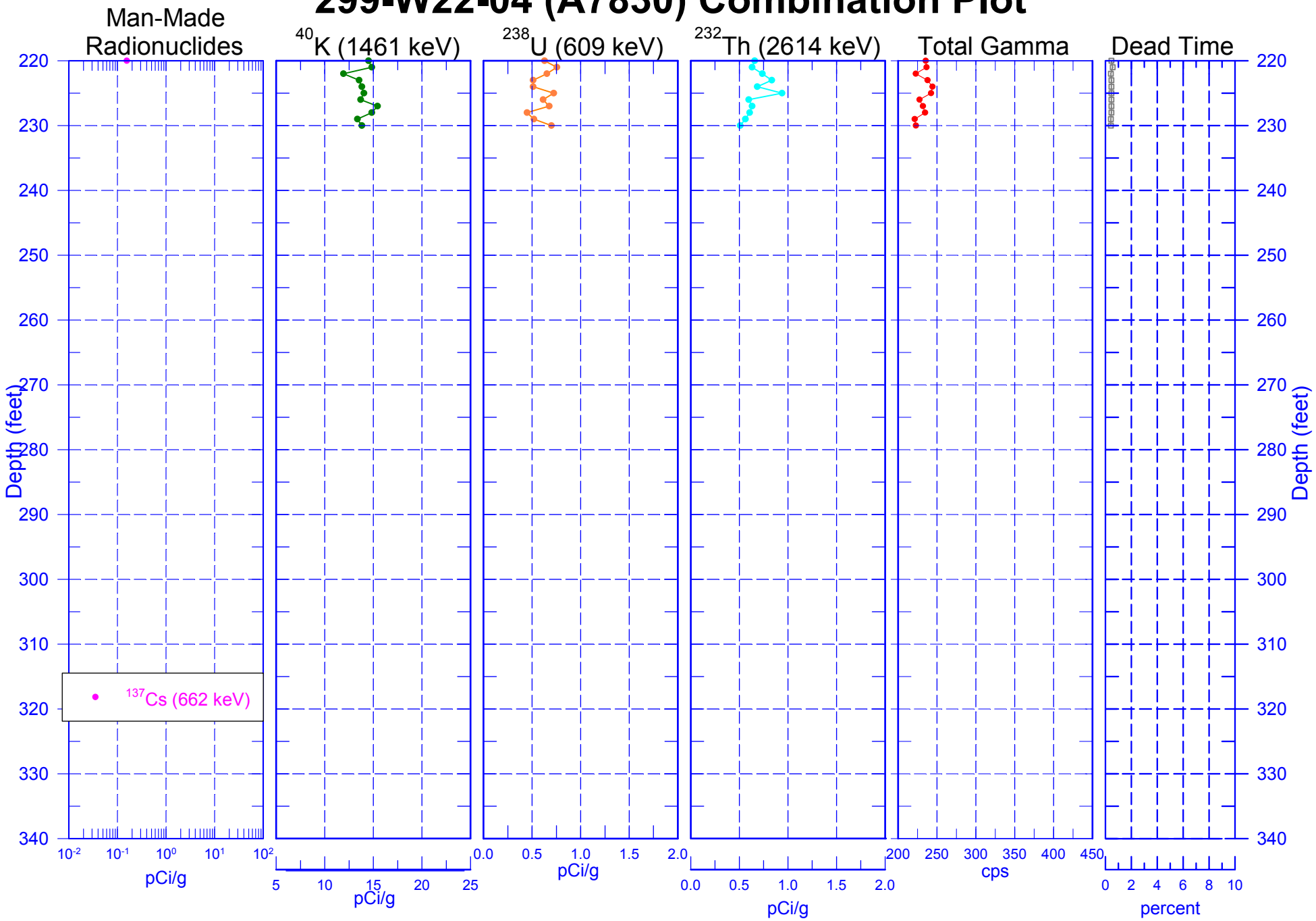


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Logging Date - 08/28/03

299-W22-04 (A7830) Combination Plot

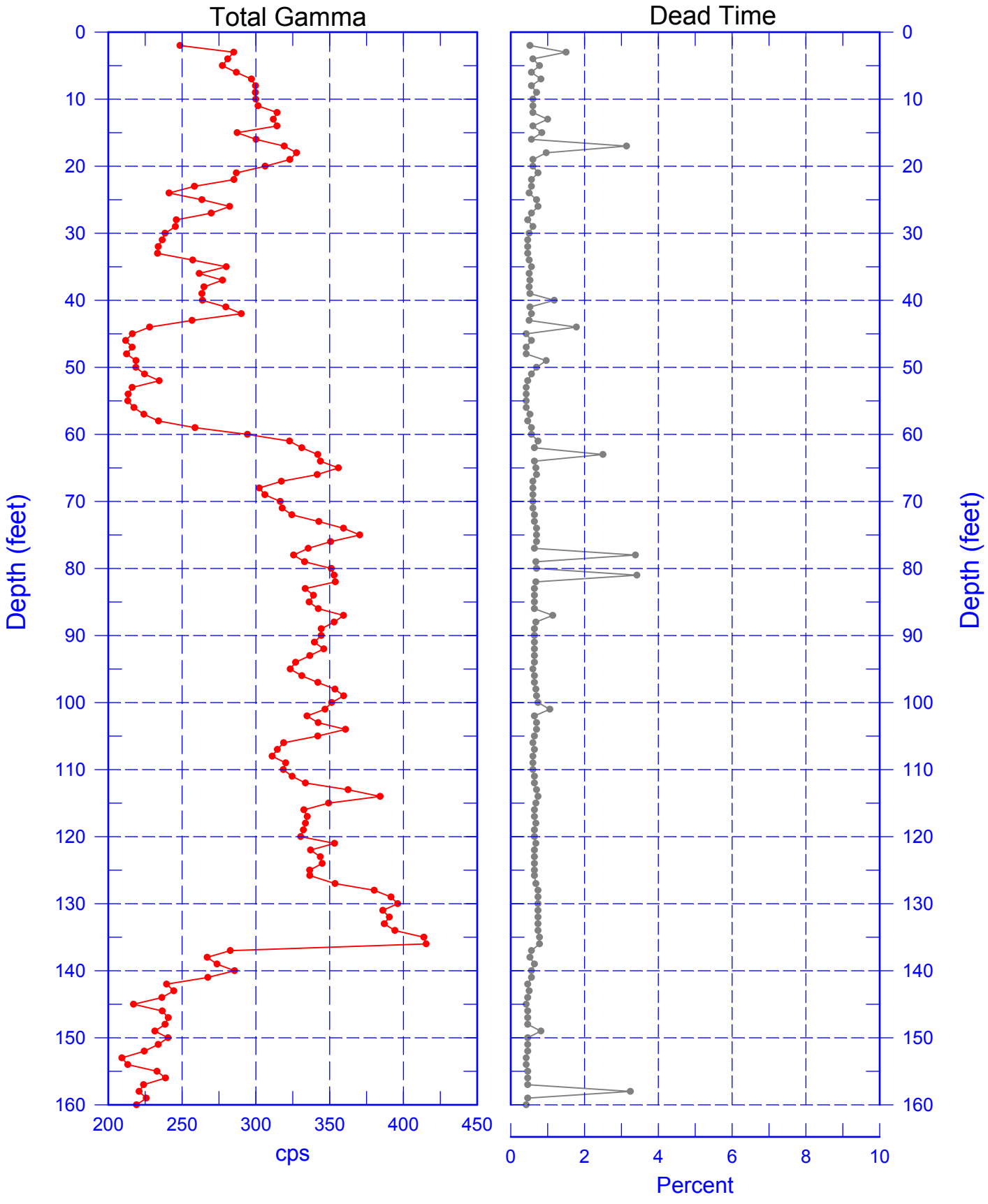


Zero Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Logging Date - 08/28/03

299-W22-04 (A7830)
Total Gamma & Dead Time

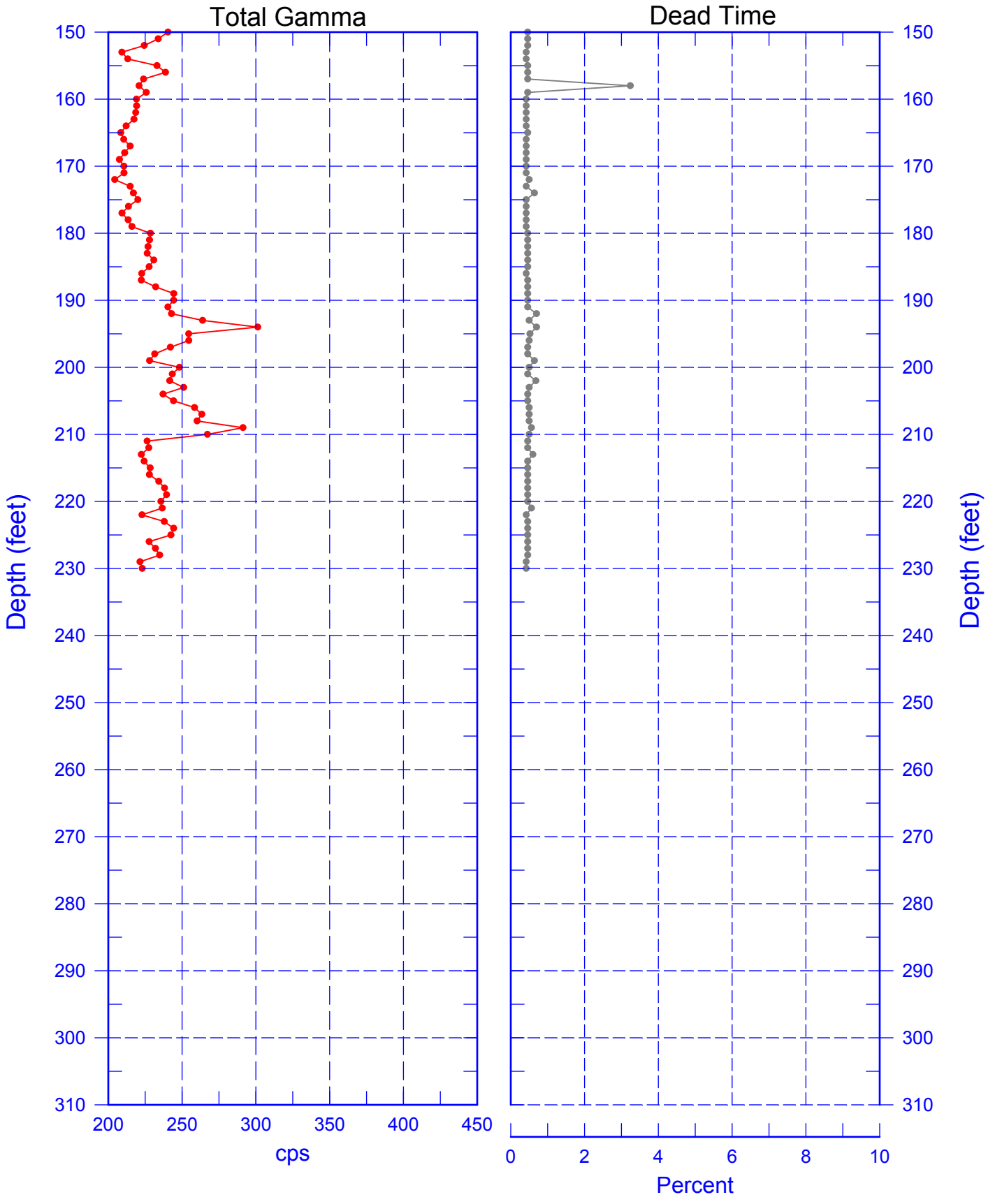


Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Log Date - 08/28/03

299-W22-04 (A7830)
Total Gamma & Dead Time



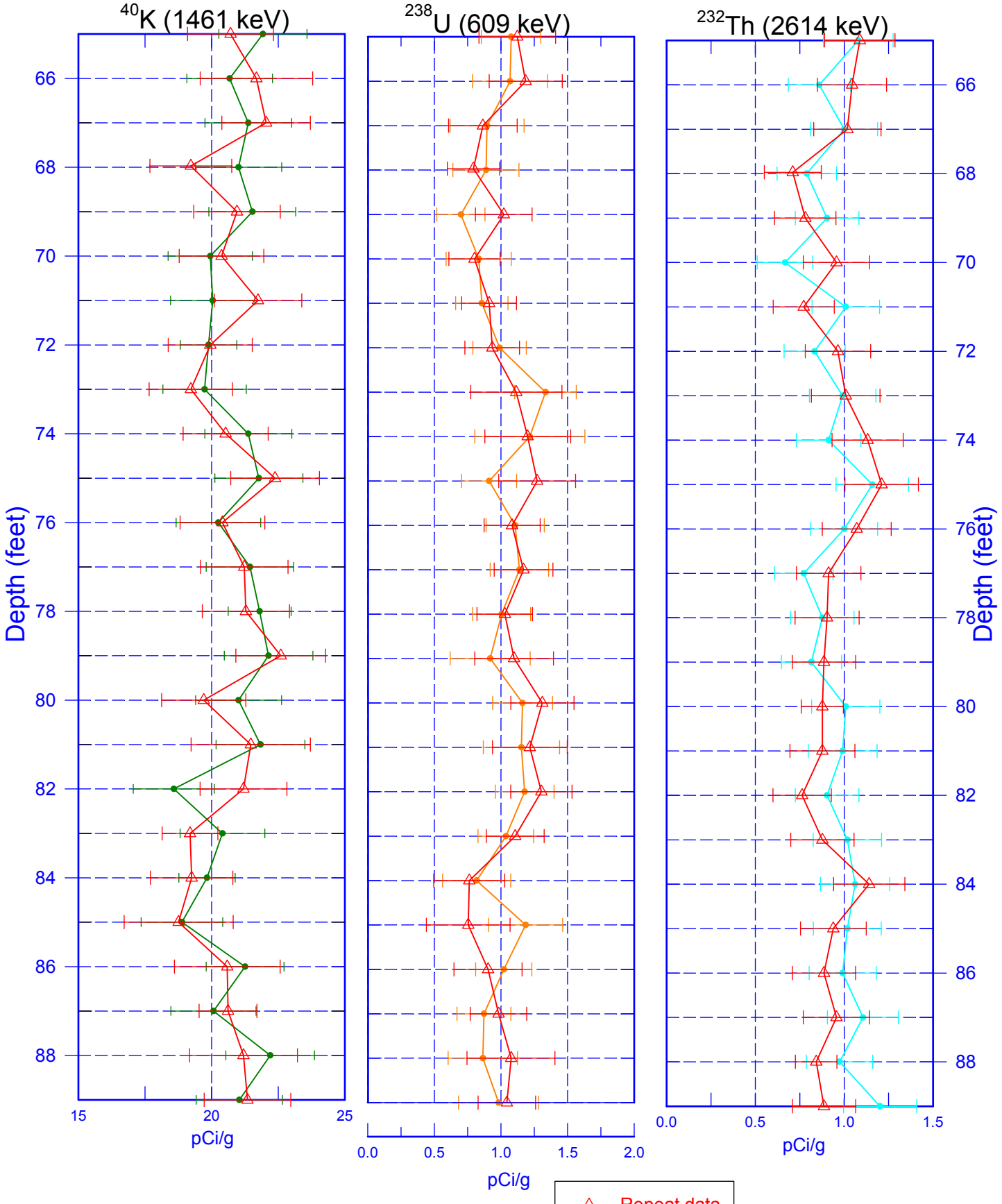
Reference - Top of Casing

Depth scale: 1" = 20 ft

Last Log Date - 08/28/03

299-W22-04 (A7830)

Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

Last Log Date - 08/28/03